San Antonio Technology Workshop

Instrument Technology and Architecture
IPDT Breakout Group

Chris Stevens

May 16, 1996

IT&A Breakout Participants

• **Christopher Stevens (Co-Lead)**	**JPL**
• **Roger Avant (Co-Lead)**	**NASA GSFC**
• **Preston Carraway**	**NASA LaRC**
• **David Shostak**	**Irvine Sensors**
• **A. Chattergee**	**Georgia Tech**
• **Edward Howard**	**NOAA/SA04**
• **Karl Blasius**	**Hughes SBRS**
• **Ulli Hartman**	**Orbital Sciences Corp.**
• **Scott Manlief**	**TRW**
• **Robert Nelson**	**JPL**
• **Robert Stirbl**	**JPL**

Instrument Technologies & Architectures IPDT

Assessment

Successes:

- IPDT proposal evaluations provide far-reaching insight into readiness level of industry, university & government instrument technologies.
- Generation of 16 detailed technology roadmaps has provided a better focus and framework for technology development.
- Potential roadmap gap identified in GEO instrument technologies (identification of roadmap gaps to be done at next IPDT meeting).
- Significant roles in DS-1 and EO-1 for instrument technologies.
  - MICAS for DS-1
  - AEISR for EO-1, AC(LEISA) and MiniGrating Spectrometer
- Alignment and augmentation of core technology funding and ATD funding to support enabling technologies for advanced atmospheric sounder (IMAS).

Instrument Technologies & Architectures IPDT

Assessment

Concerns:

- Funding driven stretch out of program schedule results in a lower frequency of flights.
- Need to attract alignment of core technology program investments in support of high-value NMP technologies for future remote sensing science needs.
- Expectations of selected participants—(write a proposal for an opportunity to write a proposal).
- Need to improve inter-IPDT technical cooperation/ communication.

Instrument Technologies & Architectures IPDT

Recommendations

- Place more emphasis on obtaining “flights of opportunity” to provide low-cost alternative validation for instrument technologies (e.g. Foo-piggyback payloads, GAS, attached payloads, sounding rocket, space station,...).
- Develop strategy for achieving maximum relevant benefits from NMP SBIR Focused Topic and synergistic collaboration with MTPE Focused Topic.
- Work with Code X, Level 3 program management to achieve timely support for technologies to be validated in NMP.

Instrument Technologies & Architectures IPDT

Recommendations

- Improve roadmaps to include definitive criteria and processes for validation of IT&A technologies.
  - include lab, field, flight validation as appropriate
- Define methodology to achieve “testability” for both performance and reliability for “highly integrated” electronic modules (e.g. FPAs, MMIC receivers).
- Put all IPDT members names and technologies for which they were selected on the team WWW sites, include access for all IPDT members to all NMP sites and put action item process (Q/A) in place for each IPDT WWW page.

Instrument Technologies & Architectures IPDT

Recommendations

- Define process for updating and efficiently tracking progress on technology roadmap execution.
- Define process for supporting annual EO mission candidate review and update (membership on ADT provides vehicle for involvement).
- Hold EOS “A” instruments workshops to focus efforts on instrument technologies for EO missions.
- Renew efforts to define instrument technologies relevant to GEO mission capabilities.

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IPDT Cross Cutting Issues
Breakout Group

Ralph Roncoli

May 16, 1996

IPDT Cross Cutting Issues:
Working Group Members

- Ralph Roncoli, JPL, Architecture Development Team
- Margie Homer, JPL, NMP Office
- Martha Del Alto, ARC, NMP Documentation
- Helen Stewart, ARC, NMP Documentation
- Rob Stirbl, JPL, Imaging and Spectroscopy
- Raymond Roberts, NASA HQ Code Y
- Karl Blasius, Hughes SBRC
- Ed Howard, NOAA/SAO4
- Derek Winstanley, NOAA
- David Schimmel,GIT, µElectronics

Cross Cutting Issues:

Working Group Summary

- Program Management
- IPDT Interdependence and Responsibilities
- Flight Project Process and Models
- Connectivity and Communication

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Program Management

- Legal/Contractual Issues Associated with Teaming Relationships
  - Streamlining processes
  - Proprietary information
- IPDT <---> Flight Team Relationship
- Program Δs in project decisions and technology selection process
  - EO-1
  - late flight technology additions
  - non-IPDT technologies / national pipeline
- Consistent Program Philosophy for Rapid Flight Development
- Should there be a specific team for new management technologies?

IPDT Interdependence and Responsibilities

- Co-sponsorship of technologies
- Customer/Provider technology, for example, APS for imaging, optical navigation, communication
- Roadmap program strategy
- IPDT <----> other

Flight Project Process and Models

- Documentation of successfully streamlined processes
- On-going development for future processes and tools
- Knowledge, capture and re-use

Connectivity and Communication

- Rapid dissemination of information
- How do you document problems across the program?
  - actions items/open & closed

    across meetings, IPDTs, projects
- Efficient use of the web

  http://nmp-jpl-www.arc.nasa.gov/

  Helen Stewart (@ARC): 415-604-4678

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Recommendations

- **Program Management**

  JPL/NMP has streamlined contractual agreements via performance based statements of work, and other common sense approaches. We recommend that these approaches be shared and adopted program wide.

- **IPDT Interdependence and Responsibilities**

  Continual iterations and updating of roadmaps.

- **Flight Project Process and Models**

  Capture and reuse

- **Connectivity and Communication**

  Program endorsement of web use.

IPDT Technology Dependence

IPDT Customer

IPDT Provider	Autonomy	ISIM	IT&A	Comm	MAMS	μElectronics
Autonomy						
ISIM			MEMS for precision pointing and micro-optics			
IT&A		Focal planes and optics for in situ imaging and spectroscopy				
Comm						
MAMS						
μElectronics						

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IPDT Future Roles and Responsibilities Breakout Group

Ulli Hartman

May 16, 1996

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IPDT
Future Roles and Responsibilities

IPDT Future Roles & Responsibilities

Workgroup Membership:

Name	Organization	IPDT
Randy Bass	Honeywell	Microelectronics
Bill Gail	Ball Aerospace	Instruments
Cheryl Lapham	Honeywell	Microelectronics
Barry Meredith	NASA/Langley	Instruments
Scott Manlief	TRW	Instruments
David Bearden	Aerospace Corp.	
U. Hartmann	OSC	Instruments

IPDT Goal

- NASA
  - Maintain ready access to new technologies
- Participants (industry, academia, etc)
  - Obtain flight validation of product

IPDT Future Roles

- Recommend technologies/products to the NMP for flight validation missions:
  - Identification and tracking of technologies Prioritize technologies per science working group guidelines and NMP goals
  - Maintain roadmaps
- Recommend RTD funding priority to the lead centers

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IPDT Membership

- Continue funded membership for IPDT participation
- Continue JPL/GSFC co-leadership
- Control/re-evaluate membership via periodic proposal process for:
  - Adding new members
  - Eliminating “non-performing” members
  - Providing continuity for “performing” members

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IPDT Membership (continued)

- Recommended proposal process
  - AO every year, however contractual period of performance no less than 24 months
  - Two classes of proposals
    - Specific technology
    - Breadth of technology base
- Implicit in above is maintenance of performing large aerospace organizations and roll-in / roll-out of smaller businesses and universities
- Unsolicited proposals accepted anytime

Recommendations

- Survey current IPDT team members to obtain broader perspective
- Representative questions include:
  - Effectiveness of IPDT to identify, prioritize, and recommend candidate technologies
  - What recommendations do you have to make the IPDT process more effective
  - What is the value of the IPDT team to your organization

Recommendations (continued)

- Representative questions include:
  - Did the process work as advertised
    - What did
    - What did not
  - Should IPDT technology areas be redefined
  - Should innovative system level technologies be part of the IPDT team roles

Attendee List